



## SEQUENCE LISTING

<110> ~~Colden~~, Peter L.

Murphy, Brian R.

Whitehead, Stephen S.

&lt;120&gt; PRODUCTION OF ATTENUATED CHIMERIC RESPIRATORY SYNCYTIAL VIRUS VACCINES FROM CLONED NUCLEOTIDE SEQUENCES

&lt;130&gt; 17634-5-2

&lt;140&gt; US

&lt;141&gt; 1999-04-13

&lt;150&gt; US 08/892,403

&lt;151&gt; 1997-07-15

&lt;150&gt; US 60/047,634

&lt;151&gt; 1997-05-23

&lt;150&gt; US 60/046,141

&lt;151&gt; 1997-05-09

&lt;150&gt; US 60/021,773

&lt;151&gt; 1996-07-15

&lt;160&gt; 21

&lt;170&gt; PatentIn Ver. 2.0

&lt;210&gt; 1

&lt;211&gt; 15223

&lt;212&gt; DNA

&lt;213&gt; respiratory syncytial virus

&lt;400&gt; 1

acgcgaaaaaa atgcgtacaa caaacttgca taaaccaaaa aaatggggca aataagaatt 60  
tgataagtac cacttaaatt taactccctt ggtagagat gggcagcaat tcattgagta 120  
tgataaaagt tagattacaa aatttttttg acaatgatga agtagcattt ttaaaaataa 180  
catgctatac tgataaaatta atacatttaa ctaatgcctt ggctaaggca gtgatacata 240  
caatcaaatt gaatggcatt gtgttgtgc atgttattac aagtagtgtat atttgcctta 300  
ataataatat tgtatgaaaa tccaatttca caacaatgcc agtactacaa aatggaggtt 360  
atatatggaa aatgatggaa ttaacacatt gctctcaacc taatggtcta ctagatgaca 420  
attgtgaaat taaattctcc aaaaaactaa gtgattcaac aatgaccaat tatatgaatc 480  
aattatctga attacttggaa tttgatctta atccataaat tataattaat atcaacttagc 540  
aaatcaatgt cactaacacc attagttaat ataaaactta acagaagaca aaaatggggc 600  
aaataaatca attcagccaa cccaaaccatg gacacaaccc acaatgataa tacaccacaa 660  
agactgatga tcacagacat gagaccgttg tcacttgaga ccataataac atcactaacc 720

agagacatca taacacacaa atttatatac ttgataaattc atgaatgcattt gatggaaaa 780  
cttgatgaaa agcaggccac atttacatttc ctggtaactt atgaaatgaa actattacac 840  
aaagtaggaa gcactaaata taaaaaatat actgaataca acacaaaata tggcactttc 900  
cctatgccaa tattcatcaa tcattgtggg ttcttagaat gcattggcat taagcctaca 960  
aagcataactc ccataatata caagtatgtat ctcattccat aaatttcaac acaatattca 1020  
cacaatctaa aacaacaact ctatgcataa ctatactcca tagtccagat ggagcctgaa 1080  
aattatagta atttaaaact taaggagaga tataagatag aagatggggc aaatacaacc 1140  
atggcttta gcaaaagtcaa gttgaatgtat acactcaaca aagatcaact tctgtcatcc 1200  
agcaaataca ccattccaaacg gagcacagga gatagtattt atactcctaa ttatgtatgt 1260  
cagaaacaca tcaataagtt atgtggcatg ttattatca cagaagatgc taatcataaa 1320  
ttcactgggt taataggtat gttatatgcg atgtcttaggt taggaagaga agacaccata 1380  
aaaatactca gagatgcggg atatcatgtat aaagcaaattt gatgtatgtt aacaacacat 1440  
cgtcaagaca ttaatggaaa agaaatgaaa tttgaatgtt taacattggc aagcttaaca 1500  
actgaaattc aaatcaacat tgagatagaa tctagaaaaat cctacaaaaaa aatgctaaaa 1560  
gaaatgggg aggttagctcc agaatacagg catgactctc ctgattgtgg gatgataata 1620  
ttatgtatag cagcatttgtt aataactaaa ttagcagcag gggacagatc tggcttaca 1680  
gccgtgatta ggagagctaa taatgtccta aaaaatgaaa tgaacacgta caaaggctta 1740  
ctacccaagg acatagccaa cagcttctat gaagtgtttt aaaaacatcc ccactttata 1800  
gatgtttttt ttcattttgg tatagcacaat tcttctacca gaggtggcag tagagttgaa 1860  
gggattttt caggattgtt tatgaatgcc tatgggtgcag ggcaagtgtt gttacgggtgg 1920  
ggagtcttag caaaatcagt taaaatattt atgttaggac atgttagtgc gcaagcagaa 1980  
atggaacaag ttgttgagggt ttatgaatat gcccääaat tgggtggta agcaggattc 2040  
taccatatat tgaacaaccc aaaagcatca ttattatctt tgactcaatt tcctcacttc 2100  
tccagtgttag tattaggcaa tgctgctggc cttaggcataa tgggagagta cagaggtaca 2160  
ccgaggaatc aagatctata tgatgcagca aaggcatatc ctgaaacaact caaagaaaaat 2220  
ggtgtgatta actacagtgt actagacttg acagcagaag aacttagaggc tatcaaacat 2280  
cagcttaatc caaaagataa tgatgttagag ctttgagttt ataaaaatg gggcaaataa 2340  
atcatcatgg aaaagttgc tcctgaattt catggagaag atgcaacacaa cagggctact 2400  
aaattcttag aatcaataaa gggcaaattt acatcacccaa aagatccccaa gaaaaaagat 2460  
agtatcatat ctgtcaactc aatagatata gaagtaacca aagaaagccc tataacatca 2520  
aattcaacta ttatcaaccc aacaaatgag acagatgata ctgcaggaa caagccaaat 2580  
tatcaaaagaa aacctcttagt aagtttcaaa gaagaccata caccaagtga taatcccttt 2640  
tctaaactat acaaagaaac catagaaaca tttgataaca atgaaagaaga atccagctat 2700  
tcatacgaag aaataaatga tcagacaaac gataatataa cagcaagattt agataggatt 2760  
gatgaaaaat taagtgaaat acttaggaatg cttcacacat tagtagtggc aagtgcagga 2820  
cctacatctg ctcgggatgg tataagagat gccatgggg gtttaagaga agaaatgata 2880  
gaaaaaatca gaactgaagc attaatgacc aatgacagat tagaagctat ggcaagactc 2940  
aggaatgagg aaagtgaaaa gatggcaaaa gacacatcag atgaaagtgc tctcaatcca 3000  
acatcagaga aattgaacaa cctattggaa gggaaatgata gtgacaatga tctatcactt 3060  
gaagatttctt gattagttac caatcttac atcaacacac aataccaaca gaagaccaac 3120  
aaactaaacca acccaatcat ccaacccaaac atccatccgc caatcagccca aacagccaaac 3180  
aaaacaacca gccaatccaa aactaaccac ccggaaaaaa tctataatat agttacaaaa 3240  
aaaggaaagg gtggggcaaa tatggaaaca tacgtgaaca agcttcacga aggctccaca 3300  
tacacagctg ctgttcaata caatgtttt gaaaaagacg atgaccctgc atcacttata 3360  
atatgggtgc ccatgttcca atcatctatg ccagcagatt tacattataaa agaacttagt 3420  
aatgtcaaca tactagtggaa acaaataatcc acacccaaagg gacccactt aagagtcattg 3480  
ataaaactcaaa gaagtgcagt gctagcacaatgcccagca aatttacccat atgcgctaat 3540  
gtgtccttgg atgaaagaag caaacttagca tatgtatgtaa ccacacccctg tgaatcaag 3600

gcatgtagtc taacatgcct aaaatcaaaa aatatgttga ctacagttaa agatctcact 3660  
atgaagacac tcaaccctac acatgatatt attgctttat gtgaatttga aaacatagta 3720  
acatcaaaaa aagtataat accaacatac ctaagatcca tcagtgtcag aaataaagat 3780  
ctgaacacac ttgaaaatat aacaaccact gaattcaaaa atgctatcac aaatgcaaaa 3840  
atcatccctt actcaggatt actattagtc atcacagtg ctgacaacaa aggagcattc 3900  
aaatacataa agccacaaag tcaattcata gttagatctt gagcttacct agaaaaagaa 3960  
agtatatatt atgttaccac aaatttggaa cacacagcta cacgatttgc aatcaaacc 4020  
atggaagatt aacccttttc ctctacatca gtgtgttaat tcatacaaac tttctaccta 4080  
cattctcac ttcaccatca caatcacaaa cactctgtgg ttcaccaat caaacaac 4140  
ttatctgaag tcccagatca tcccaagtca ttgttatca gatctgtac tcaaataagt 4200  
taataaaaaa tatacacatg gggcaaataa tcattggagg aaatccaact aatcacaata 4260  
tctgttaca tagacaagtc cacacaccat acagaatcaa ccaatggaaa atacatccat 4320  
aacaatagaa ttctcaagca aattctggcc ttactttaca ctaatacaca tgatcacaac 4380  
aataatctct ttgctaatac taatctccat catgattgca atactaaaca aactttgtga 4440  
atataacgta ttccataaca aaacccttga gttaccaaga gctcgagtca acacatagca 4500  
ttcatcaatc caacagcccc aaacagtaac cttgcattt aaaaatgaaca accccttacct 4560  
ctttacaaca cctcattaac atcccaccat gcaaaccact atccatacta taaagtagtt 4620  
aattaaaaat agtcataaca atgaactagg atatcaagac taacaataac attggggcaa 4680  
atgcaaacat gtccaaaaac aaggaccaac gcaccgctaa gacattagaa aggacctggg 4740  
acactctcaa tcattttata ttcatatcat cgtgcttata taagttaat cttaatctg 4800  
tagcacaat cacattatcc attctggcaa tgataatctc aacttcactt ataattgcag 4860  
ccatcatatt catagcctcg gcaaaccaca aagtcacacc aacaactgca atcatacaag 4920  
atgcaacaag ccagatcaag aacacaaccc caacatacct caccagaat cctcagctt 4980  
gaatcagtcc ctctaattccg tctgaaatta catcacaaat caccaccata cttagttcaa 5040  
caacaccagg agtcaagtca accctgcaat ccacaacagt caagaccaaa aacacaacaa 5100  
caactcaaac acaacccagc aagcccacca caaaacaacg ccaaaacaaa ccaccaagca 5160  
aacccaaataa tgattttcac tttgaagtgt tcaactttgt accctgcagc atatgcagca 5220  
acaatccaaac ctgctgggct atctgcaaaa gaataccaaa caaaaaacca ggaaagaaaa 5280  
ccactaccaa gcccacaaaa aaaccaaccc tcaagacaaac caaaaaagat cccaaaccc 5340  
aaaccactaa atcaaaggaa gtaccacca ccaagcccc agaagagcca accatcaaca 5400  
ccaccaaaac aaacatcata actacactac tcacctccaa caccacagga aatccagaac 5460  
tcacaagtca aatggaaacc ttccactcaa ttccctccga aggaatcca agcccttetc 5520  
aagtctctac aacatccgag taccatcac aacccatcatc tccacccaaac acaccacgccc 5580  
agtagttact taaaaacata ttatcacaaa aggcttgac caacttaaac agaatcaaaa 5640  
taaactctgg gccaataaac aatggagttg ctaatcctca aagcaaatgc aattaccaca 5700  
atcctcaactg cagtcacatt ttgtttgct tctggtcaaa acatcaactg agaattttat 5760  
caatcaacat gcagtgcagt tagcaaaggc tatcttagtg ctctgagaac tggttggat 5820  
accagtgta taactataga attaagtaat atcaagaaaa ataagtgtaa tggAACAGAT 5880  
gctaaaggtaa aattgataaa acaagaatta gataaaatata aaaatgctgt aacagaattg 5940  
cagttgctca tgcAAAGCAC acaagcaaca aacaatcgag ccagaagaga actaccaagg 6000  
tttatgaatt atacactcaa caatgccaaa aaaaccaatg taacattaag caagaaaaagg 6060  
aaaagaagat ttcttggtt ttgttaggt gttggatctg caatcgccag tggcgttgt 6120  
gtatctaagg tcctgcaccc agaagggaa gtgaacaaga tcaaaaagtgc tctactatcc 6180  
acaaacaaagg ctgttagtcag cttatcaaatt ggagtttagtg ttttaaccag caaagtgtta 6240  
gacccatcaaaa actatataca taaacaatttgc ttaccttatttgc tgaacaagca aagctgcagc 6300  
atatacaata tagaaaactgt gatagagttc caacaaaaga acaacagact actagagatt 6360  
accagggaaat ttagtgttaa tgcaggcgta actacacccctg taagcactta catgtttaact 6420  
aatagtgaat tattgtcatt aatcaatgat atgcctataa caaatgatca gaaaaagtt 6480

atgtccaaca atgttcaa atgttagacag caaagttaact ctatcatgtc cataataaaa 6540  
gaggaagtct tagcatatgt agtacaatta ccactatatg gtgttataga tacaccctgt 6600  
tggaaactac acacatcccc tctatgtaca accaacacaa aagaagggtc caacatctgt 6660  
ttaacaagaa ctgacagagg atggtaactgt gacaatgcag gatcagtatc tttcttccca 6720  
caagctgaaa catgtaaagt tcaatcaa atcgagtat ttgtgacacaat gaacagttt 6780  
acattacca gtgaagtaaa tctctgcaat gttgacat at tcaaccccaa atatgattgt 6840  
aaaattatga cttcaaaaac agatgtaa agtccgtt tcacatctctt aggagccatt 6900  
gtgtcatgtc atggcaaaac taaatgtaca gcatccaata aaaatcggtt aatcataaag 6960  
acatttcta acgggtgcga ttatgtatca aataaagggg tggacactgt gtctgttagt 7020  
aacacattat attatgtaaa taagcaagaa ggtaaaagtc tctatgtaaa aggtgaacca 7080  
ataataaatt tctatgaccc attagtattc ccctctgtat aatttgatgc atcaatatct 7140  
caagtcaacg agaagattaa ccagagccta gcatttattc gtaaaatccga tgaatttata 7200  
cataatgtaa atgctggtaa atccaccaca aatatcatga taactactat aatttagtg 7260  
attatagtaa tattgttattc attaattgtc gttggactgc tcttatactg taaggccaga 7320  
agcacaccag tcacactaag caaagatcaa ctgagtgtt aaaaataat tgcattttagt 7380  
aactaaataa aaatagcacc taatcatgtt cttacaatgg tttactatct gctcatagac 7440  
aaccatctg tcattggatt ttctttaaat ctgaacttca tcgaaactctt catctataaa 7500  
ccatctcact tacactattt aagtagattc ctatgttata gttatataaa acacaattgc 7560  
atgccagatt aacttaccat ctgtaaaaat gaaaactggg gcaaatatgt cacgaaggaa 7620  
tccttgcaaa ttgaaattc gaggtcattt cttttatgtt aagaggtgtc attttatgtca 7680  
taattttttt gaatggccac cccatgcact gcttgttataa caaaaacttta tgtaaacag 7740  
aataacttaag tctatggata aaagttataga taccttatca gaaaataatgt gagctgcaga 7800  
gttggacaga acagaagagt atgctttgg tttttttttt gttatataagg 7860  
atcaataaac aatataacta aacaatcgc atgtgttgc atgagcaac tcctcaactga 7920  
actcaatagt gatgatataca aaaaatgtt gggacatgaa gagctaaattt caccaagat 7980  
aagagtgtac aataactgtca tatcatatat tgaaagcaac agggaaaaaca ataaacaaac 8040  
tatccatctg ttaaaaatg tgccagcaga cgtattgtt aaaaaccatca aaaacacatt 8100  
ggatattccat aagagcataa ccatcaacaa cccaaaagaa tcaactgtt gatgataaaa 8160  
tgaccatgcc aaaaataatg atactacctg acaaataatcc ttgttgtata acttccatatac 8220  
taataacaag tagatgttata gtttactatgtt ataatcaaaa gaacacacta tatttcaatc 8280  
aaaacaaccc aaataaccat atgtactcac cgaatcaac attcaatgaa atccattgg 8340  
cctctcaaga attgatttgc acaatttcaaa attttctaca acatcttagt attatttgg 8400  
atatatatac aatatatata ttagtgcata aacactcaat tcttacactc accacatctgt 8460  
tacatttata attcaacaa ttcaagttt gggacaaaat ggatcccattt attaatggaa 8520  
attctgttata tttttatctt accgatagtt atttttttgg tttttatctt ttctcagat 8580  
gtaatgtttt aggaagttt atattcaatg gtccttatct caaaaatgtt tataccaact 8640  
taatttagtag aaaaatcca ttaatagaac acatgtatctt aaagaaacta aatataacac 8700  
agtccttaat atctaagtat cataaaggtt aaaaatgtt agaagaaccc acttattttc 8760  
agtcttactt tatgacatac aagagtatgtt cctcgatcaga acagattgtt accactaattt 8820  
tacttttttata gataataaga agagctatgtt aaataatgtt tttttttttt tttttttttt 8880  
tgaataaaactt agggcttaaa gaaaaggaca agatcaatgc caacaatggaa caagatgtt 8940  
acaactcgtt tatttacgacc ataatcaag atgtatatactt ttcagttt gatgataatc 9000  
aatctcatct taaaggcagac aaaaatctactt ctacaaaaca aaaaacacaca atcaaaaacaa 9060  
cactcttgcataa gaaaattgtt tttttttttt tttttttttt tttttttttt tttttttttt 9120  
ttaacttata cacaacatata aacaacatata taacacatgtt tcgatcaat gaggtttttt 9180  
accatgggtt tacattgttata gataatcaaa ctctttttttt tttttttttt tttttttttt 9240  
aatatgtttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt 9300  
aattcttgac atggaaagat attacccctt gtagattttt tttttttttt tttttttttt 9360

ttagtaactg cttgaacaca ttataataaaa gcttaggctt aagatgcggg ttcaataatg 9420  
ttatcttgac acaactattc ctttatggag attgtatact aaagctattt cacaatgagg 9480  
ggttctacat aataaaaagag gtagagggat ttattatgtc tctaattttt aatataacag 9540  
aagaagatca attcagaaaa cgattttata atagtatgct caacaacatc acagatgctg 9600  
ctaataaaagc tcagaaaaat ctgctatcaa gagtatgtca tacattatta gataagacag 9660  
tgtccgataa tataataaat ggcagatgga taattcttatt aagtaagttc cttaaattaa 9720  
ttaagcttgc aggtgacaat aaccttaaca atctgagtga actatatttt ttgttcagaa 9780  
tatttgaca cccaatggta gatgaaagac aagccatgga tgctgttaaa attaattgca 9840  
atgagaccaa attttacttg ttaagcagtc tgagtatgtt aagaggtgcc tttatatata 9900  
gaattataaa agggtttgc aataattaca acagatggcc tactttaaga aatgcattt 9960  
tttaccctt aagatggta acttactata aactaaacac ttatccttct ttgttggAAC 10020  
ttacagaaag agatttgatt gtgttacag gactacgtt ctatcgtagg ttgcgttgc 10080  
ctaaaaaagt ggatcttgc aatgattataa atgataaaagc tatatcacct cctaaaaatt 10140  
tgatatggac tagttccct agaaattaca tgccatcaca catacaaaac tatatagaac 10200  
atgaaaaatt aaaattttcc gagagtgata aatcaagaag agtatttagag tattatTTA 10260  
gagataacaa attcaatgaa tgtgatttat acaactgtgt agttaatcaa agttatctca 10320  
acaaccctaa tcatgtggta tcattgacag gcaaaagaaag agaactcagt gtaggtagaa 10380  
tgtttgcattt gcaaccggga atgttcagac aggttcaaattt attggcagag aaaatgatag 10440  
ctgaaaacat ttacaattt tttcttgcattt gtcttacaag atatggtgat cttagaactac 10500  
aaaaaatatt agaactgaaa gcaggaataa gtaacaatc aaatcgctac aatgataatt 10560  
acaacaattt cattagtaag tgctctatca tcacagatct cagcaaattt aatcaagcat 10620  
ttcgatatga aacgtcatgt attttagtgc atgtgctggta tgaactgtcat ggtgtacaat 10680  
ctctatTTTc ctggttacat ttaactattt ctcatgtcac aataatatgc acatataggc 10740  
atgcaccccc ctatataggc gatcatattt tagatcttca caatgttagat gaacaaagtg 10800  
gattatatac atatcacatg ggtggcatcg aagggtggtg tcaaaaaacta tggaccatag 10860  
aagctatatc actattggat ctaatatctc tcaaaaggaa attctcaatt actgctttaa 10920  
ttaatggta caatcaatca atagatataa gcaaaaccaat cagactcatg gaaggtaaaa 10980  
ctcatgctca agcagattt ttgcttagcat taaatagcct taaattactg tataaagagt 11040  
atgcaggcat aggccacaaa ttAAAAGGAA ctgagactt tatatcacga gatatgcaat 11100  
ttatgagtaa aacaatttcaaa cataacgggtg tatattaccc agctagtata aagaaagtcc 11160  
taagagtggg accgtggata aacactatac ttgatgattt caaagtggatg cttagaatcta 11220  
taggtagttt gacacaagaa tttagaatata gaggtggaaag tctattatgc agttaatatt 11280  
ttagaaatgt atggttatattt aatcagattt ctctacaatt aaaaaatcat gcattatgt 11340  
acaataaaact atatttggac atattaaagg ttctgaaaca cttaaaaaacc ttttttaatc 11400  
ttgataatattt tgatacagca ttaacattttt atatgaattt acccatgtta ttgggtggtg 11460  
gtgatcccaa ctgttataat cgaagtttct atagaagaac tcctgacttc ctcacagagg 11520  
ctatagttca ctctgtgttc atacttagttt attatacaaa ccatgactta aaagataaac 11580  
ttcaagatct gtcagatgtt agattgaata agttcttacat atgcataatc acgtttgaca 11640  
aaaaccctaa tgctgaattt gtaacatttga tgagagatcc tcaagcttta gggtctgaga 11700  
gacaagctaa aattacttagc gaaatcaata gactggcagt tacagaggtt ttgagtacag 11760  
ctccaaacaa aatattctcc aaaagtgcac aacattatac tactacagag atagatctaa 11820  
atgatattt gcaaaaatata gaaacctacat atcctcatgg gctaaaggtt gtttatgaaa 11880  
gtttaccctt ttataaaagca gagaaaatag taaatcttattt atcaggtaca aaatctataa 11940  
ctaacataact ggaaaaaaact tctgcccattt acttaacaga tattgtatgaa gccactgaga 12000  
tgatgaggaa aaacataact ttgcttataa ggatacttcc attggattgtt aacagagata 12060  
aaagagagat attgagtatg gaaaacctaa gtattactga attaagcaaa tatgttaggg 12120  
aaagatcttgc tcttttatcc aatatacgatg ttgttacatc acccagtatc atgtatacaa 12180  
tggacatcaa atatactaca agcactatattt cttagtggcat aattatagag aaatataatg 12240

ttaacagtt aacacgtgg gagagaggac ccactaaacc atgggttgg tcatctacac 12300  
aagaaaaaaa aacaatgcca gtttataata gacaagtctt aaccaaaaaa cagagagatc 12360  
aatagatct attagcaaaa ttggattggg tgtatgcate tataactata aaggatgaat 12420  
tcatgaaaga actcagcata ggaaccttg ggttaacata tgaaaaggcc aagaaattat 12480  
ttccacaata tttaagtgtc aattatttg atcgccttac agttagttagt agaccatgtg 12540  
aattccctgc atcaataccca gcttatagaa caacaaatta tcactttgac actagcccta 12600  
ttaatcgcat attaacagaa aagtatggg atgaagatata tgacatagta ttccaaaact 12660  
gtataagctt tggccttagt ttaatgtcag tagtagaaaca attactata gtatgtccta 12720  
acagaattat tctcataccct aagcttaatg agatacattt gatgaaaccc cccatattca 12780  
caggtgatgt tgatattcac aagttaaaac aagtgataca aaaacagcat atgttttac 12840  
cagacaaaaat aagtttgact caatatgtgg aattattctt aagtaataaa acactcaa 12900  
ctggatctca tggtaattct aatttaat tggcacataa aatatctgac tattttcata 12960  
atacttacat tttaagtact aatttagctg gacattggat tctgattata caacttatga 13020  
aagattctaa aggtatTTT gaaaaagatt ggggagaggg atatataact gatcatatgt 13080  
ttattaattt gaaagttttc ttcaatgctt ataagaccta tctcttgtt tttcataaag 13140  
gttatggcaa agcaaagctg gagtgtgata tgaacacttc agatcttcta tgtgtattgg 13200  
aattaataga cagtagttat tggaaagtctt tgtctaaggt atttttagaa caaaaagtt 13260  
tcaaatacat tcttagccaa gatgcaagtt tacatagagt aaaaggatgt catagcttca 13320  
aattatgggt tcttaaacgt cttaatgttag cagaattcac agttggccct tgggtgtta 13380  
acatagatta tcatccaaca cataatgaaag caatattaac ttatataagat ttgttagaa 13440  
tgggattgat aaatataagat agaatacaca taaaaataaa acacaaattc aatgtatgaat 13500  
tttatacttc taatctcttc tacattaatt ataacttctc agataataact catctattaa 13560  
ctaaacatata aaggattgct aattctgaat tagaaaataaa ttacaacaaa ttatatcatc 13620  
ctacaccaga aacccttagag aatatactag ccaatccgat taaaagtaat gacaaaaaga 13680  
caactgaatga ctattgtata ggtaaaaatg ttgactcaat aatgttacca ttgttatcta 13740  
ataagaagct tattaaatcg tctgcaatga tttagaacc 13800  
ataatttatt cccatgggt gtgattgata gaattataga tcattcaggc aatacagcca 13860  
aatccaaacca actttacact actactccc accaaatatc cttagtgcac aatagcacat 13920  
caacttactg catgcttcct tggcatcata ttaatagatt caatttgtt tttagttcta 13980  
caggttgtaa aattagtata gagtatattt taaaagatct taaaattaaa gatcccaatt 14040  
gtatagcatt cataggtgaa ggagcaggga atttatttgcgtacagta gtggaaatcc 14100  
atcctgacat aagatataatt tacagaagtc tgaaagattt caatgtatcat agtttaccta 14160  
ttgagttttt aaggctgtac aatggacata tcaacatttga ttatggtaa aatttgcacca 14220  
ttcctgctac agatgcaacc aacaacattt attggcttta tttacatata aagtttgctg 14280  
aacctatcag tcttttgc tggatgccc aattgtctgt aacagtcaac tggagtaaaa 14340  
ttataataga atggagcaag catgtaaagaa agtgcacat ctgttctca gttataataat 14400  
gtatgttaat agtaaaatataat catgtcaag atgatatttga ttcaatattt gacaatataa 14460  
ctatataaaa aacttatgtt tgcttaggca gtaagttaaa gggatcggag gtttacttag 14520  
tccttacaat aggtcctgca aatataattcc cagtattttaa tggatgtacaa aatgtcaat 14580  
tgataactatc aagaacccaa aatttcatca tgcctaaagaa agtgcataaa gagtcttattt 14640  
atgcaatataat taaaagtttgc atacccttc tttgttaccc tataacaaa aaaggaatta 14700  
atactgcatt gtcaaaacta aagagtgttgc tttagtggaga tataactatca tattctatag 14760  
ctggacgtaa tgaagttttc agcaataaaac ttataatca taagcatatg aacatcttac 14820  
aatgggttca tcatgttttgc aatttcagat caacagaact aaactataac catttatata 14880  
tggtagaaatc tacatatcct tacctaagtg aattgttaaa cagctgaca accaatgaac 14940  
ttaaaaaact gattaaaatc acaggttagtgc tggttataacaa ctttcataat gaataatgaa 15000  
taaagatctt ataataaaaaa ttcccatagc tataactataa cactgttattc aattatagtt 15060  
attaaaaattt aaaaatcata taatttttgc aataactttt agtgcactaa tcctaaagtt 15120

atcattttaa tcttggagga atadatttaa accctaatac aattggttta tatgtgtatt 15180  
aactaaatta cgagatatta gttttgaca ctttttttct cgt 15223

<210> 2  
<211> 15225  
<212> DNA  
<213> respi

<400> 2

atgcgaaaaaa atgcgtacta caaacttgca cattcgaaaa aaatggggca aataagaatt 60  
tgataagtgc tatttaagtc taacctttc aatcagaaaat ggggtgcaat tcactgagca 120  
tgataaaggtagattacaa aatttatttg acaatgacga agtagcattt taaaaataa 180  
catgttatac tgacaaatta attcttctga ccaatgcatt agccaaagca gcaatacata 240  
caattaaatt aaacggata gttttatac atgttataac aagcagtgaa gtgtgccctg 300  
ataacaacat ttagttaaaa tctaacttta caacaatgcc aatattacaa aacggaggat 360  
acatatgggat ttagattgag ttgacacact gctctcaatt aaacggtcta atggatgata 420  
attgtgaaat caaattttct aaaagactaa gtgactcagt aatgactaat tatatgaatc 480  
aaatatctga ttacttggg ctgtatctca attcatgaat tatgttttagt ctaactcaat 540  
agacatgtgt ttattaccat tttagttaat ataaaaactc atcaaaggaa aatggggcaa 600  
ataaaactcac ctaatcaatc aaactatgag cactacaaat gacaacacta ctatgaaag 660  
attaatgatc acggacatga gaccctgtc gatggattca ataataacat ctctcaccaa 720  
agaaaatcatc acacacaaat tcatatactt gataaacaat gaatgtattt taagaaaact 780  
ttagttaaaa caagctacat ttacatttctt agtcaattt gagatgaagc tactgcacaa 840  
agtagggagt accaaataca agaaatacac tgaatataat aaaaaatatg gcactttccc 900  
catgcctata ttatcaatc atggcgggtt tctagaatgt attggcatta agcctacaaa 960  
acacactcct ataataataca aatatgacct caacccgtaa attccaacaa aaaaacccaa 1020  
cccaacccaa ccaagctatt cctcaaacaa caatgctcaa tagttaagaa ggagctaatc 1080  
cgtttttagta ataaaaataa aaagtaaagc caataacata aattggggca aatacaaaga 1140  
tggctcttag caaagtcaag ttaaatgata cattaaataa ggatcagctg ctgtcatcca 1200  
gcaaatacac tattcaacgt agtacaggag ataataattga cactccaat tatgtgtgc 1260  
aaaaacacctt aaacaaacta tggatctatgc tattaatcac tgaagatgca aatcataaat 1320  
tcacaggatt aataggatgt ttatatgcta tggccaggtt aggaaggaa gacactataa 1380  
agataactaa agatgctgga tatcatgtt aagctaatgg agtagatata acaacatatac 1440  
gtcaagatataa aatggaaag gaaatgaaat tcgaagttt aacattatca agcttgacat 1500  
cagaaataca agtcaatatt gagatagaat ctagaaaatc ctacaaaaaa atgctaaaag 1560  
agatgggaga agtggctcca gaatataggc atgattctcc agactgtggg atgataatac 1620  
tgtgtatagc agcacttgcataaaccataat tagcagcagg agacagatca ggtcttacag 1680  
cagtaatttag gaggcataac aatgtcttaa aaaaatgaaat aaaaacgtac aagggtctca 1740  
taccaaaagga tatagctaac agttttatg aagtgtttga aaaaacccct catcttatag 1800  
atgttttgcactttggc attgcacaat catcaacaag agggggtagt agagttgaag 1860  
gaatcttgc aggattgttt atgaatgcct atggttcagg gcaagtaatg ctaagatggg 1920  
gagtttttagc caaatctgtt aaaaatatca tgcttaggtca tgcttagtgc caggcagaaa 1980  
tggagcaagt tggaaagtc tatgagtatg cacagaagtt gggaggagaa gctggattct 2040  
accatataattt gaacaatcca aaagcatcat tgctgtcatt aactcaattt cctaacttct 2100  
caagtgttgtt cctaggcaat gcagcaggc taggcataat gggagagttt agaggtacgc 2160  
caagaaacca ggtatctttagt gatgcagccaa aagcatatgc agagcaactc aaagaaaatg 2220  
gagtaataaa ctacagtgtt ttagacttaa cagcagaaga attgaaagcc ataaaagaatc 2280  
aactcaaccc taaagaagat gatgttagagc tttaagttt aaaaaatac gggccaaata 2340

agtcaacatg gagaagttt cacccgttaatt tcataggagaa gatgcaaata acaaagctac 2400  
caaattccta gaatcaataa agggcaagtt cgcatcatcc aaagatccta agaagaaaaga 2460  
tagcataata tctgttaact caatagatat agaagtaacc aaagagagcc cgataacatc 2520  
tggcaccaac atcatcaatc caacaagtga agccgacagt accccagaaa ccaaagccaa 2580  
ctacccaaga aaacccctag taagcttcaa agaagatctc accccaaagtg acaacccttt 2640  
ttctaaatgg tacaaaagaaa caatagaaac atttgataac aatgaagaag aatctagcta 2700  
ctcatatgaa gagataaaatg atcaaacaaa tgacaacatt acagcaagac tagatagaat 2760  
tgatgaaaaa ttaagtgaaa tattaggaat gctccatata ttatgttg caagtgcagg 2820  
acccacttca gtcgcgatg gaataagaga tgctatgtt ggcttgagag aagaaatgat 2880  
agaaaaaaa agagcggaaag cattaatgac caatgatagg ttagaggcta tggcaagact 2940  
taggaatgag gaaagcgaaa aaatggcaaa agacacccca gatgaagtgc ctcttaatcc 3000  
aacttccaaa aaatttgatg acttgttgg agacaacgat agtgacaaatg atctgtcact 3060  
tgatgatccc tgatcagtga tcaactcact cagcaatcaa caacatcaat aaaacagaca 3120  
tcaatccatt gaatcaactg ccagaccgaa caaacaatg tccgtcagcg gaaccaccaa 3180  
ccaatcaatc aaccaactga tccatcagca acctgacgaa attaacaata tagtaacaaa 3240  
aaaagaacaa gatggggcaa atatggaaac atacgtgaac aagcttcacg aaggctccac 3300  
atacacagca gctgttcagt acaatgttct agaaaaagat gatgatcctg catcaactaac 3360  
aatatgggtg cctatgttcc agtcatctgt accagcagac ttgctcataa aagaacttgc 3420  
aagcatcaac atactagtga agcagatctc tacgccccaa ggaccttcac tacgagtcac 3480  
gattaactca agaagtgcgt tgctggctca aatgcctagt aatttcatca taagcgcaaa 3540  
tgtatcatta gatgaaaagaa gcaaatttgc atatgatgtt actacacccctt gtgaaatcaa 3600  
agcatgcagt ctaacatgct taaaagtgaa aagtatgtt actacagtca aagatcttac 3660  
catgaagaca ttcaacccca ctcatgagat cattgctcta tgtgaatttg aaaatattat 3720  
gacatcaaaa agagtaataa taccaaccta tctaagacca attagtgtca aaaacaagga 3780  
tctgaactca cttagaaaaca tagcaaccac cgaattcaaa aatgttatca ccaatgcgaa 3840  
aattatccc tatgctggat tagtattatg tattcacatg actgacaata aaggagcatt 3900  
caaatatatac aagccacaga gtcaatttat agtagatctt ggtgcctacc tagaaaaaaga 3960  
gagcatatat tatgtgacta ctaattggaa gcatacagct aacacgtttt caatcaaacc 4020  
actagaggat taaatttat tatcaacact gaatgacagg tccacatata tcctcaaact 4080  
acacactata ttccaaacatc atgaacatct acactacaca cttcatcaca caaaccatc 4140  
ccactcaaaa ttccaaatca ctaccagcca ctatctgcta gaccttagagt gccaataggt 4200  
aaataaaaacc aaaatatggg gtaaatagac attagttttt gttcaatcaa tctcaacaac 4260  
catttatacc gccaattcaa tacatatact ataaatctt aaatggaaa tacatccatc 4320  
acaatagaat tcacaagcaa attttggccc tattttacac taatacatat gatcttact 4380  
ctaattctt tactaattat aatcactatt atgattgcaa tactaaataa gctaagtgaa 4440  
cataaaacat ttgttaacaa tactttgaa ctaggacaga tgcataatcaa caacacatag 4500  
tgctctacca tcatgctgtg tcaaattata atcctgtata tataaacaaa caaatccat 4560  
cttctcacag agtcatggtg tcgcaaaacc acgccaacta tcatggtagc atagagtagt 4620  
tatttaaaaa ttaacataat gatgaattat tagtatggg tcaaaaacaa cattggggca 4680  
aatgcaacca tgtccaaaca caagaatcaa cgcactgcca ggactctaga aaagacctgg 4740  
gatactctca atcatctaat tgtaatatcc tcttggttt acagattaaa tttaaaatct 4800  
atagcacaaaa tagcactatc agttctggca atgataatct caacctctt cataattgca 4860  
gccataatat tcatcatctc tgccaatcac aaagttacac taacaacggt cacagttcaa 4920  
acaataaaaa accacactga aaaaaacatc accacccatc ttactcaagt cccaccagaa 4980  
agggttagct catccaaaca acctacaacc acatcacca tccacacaaa ttccagccaca 5040  
acatcacccca acacaaagtc agaaacacac cacacaacag cacaacccaa aggcaagaacc 5100  
accacccaa cacagaccaa caagccgagc aaaaaaccac gcctaaaaaaaaa tccacccaaa 5160  
aaacccaaaag atgattacca ttttgaagtg ttcaacttcg ttccctgttag tatatgtggc 5220

aacaatcaac tttgcaaatac catdtgtaaa acaataccaa gcaacaaacc aaagaagaaa 5280  
ccaaccatca aacccacaaa caaaccaacc accaaaaacca caaacaaaag agacccaaaa 5340  
acaccagcca aaacgacgaa aaaagaaaact accaccaacc caacaaaaaa accaaccctc 5400  
acgaccacag aaagagacac cagcacctca caatccactg tgctcgacac aaccacatta 5460  
gaacacacaa tccaacagca atcccctccac tcaaccaccc cgaaaaacac accaactcc 5520  
acacaacac ccacagcatc cgagccctct acatcaaatt ccacccaaaa tacccaatca 5580  
catgcttagt tattcaaaaa ctacatctta gcagaaaacc gtgaccttac aagcaagaac 5640  
gaaattaaac ctggggcaaa taaccatgga gctgctgatc cacaggttaa gtgcaatctt 5700  
cctaactctt gctattaatg cattgtaccc cacctcaagt cagaacataa ctgaggagtt 5760  
ttaccaatcg acatgttagt cagttagcag aggttatttt agtgctttaa gaacagggtt 5820  
gtataccagt gtcataacaa tagaattaag taatataaaa gaaaccaaatt gcaatggaac 5880  
tgacactaaa gtaaaaactta taaaacaaga attagataag tataagaatg cagtgacaga 5940  
attacagcta cttatgcaaa acacaccagg tgccaaacaac cgggccagaa gagaagcacc 6000  
acagtatatg aactatacaa tcaataccac taaaacacta aatgtatcaa taagcaagaa 6060  
gaggaaacga agatttctgg gcttcttgcg aggtgttaga tctgcaatag caagtggtat 6120  
agctgtatcc aaagttctac accttgaagg agaagtgaac aagatcaaaa atgcttttt 6180  
atctacaaac aaagctgttag tcagtcatac aaatggggtc agtgctttaa ccagcaaagt 6240  
gttagatctc aagaattaca taaataacca attattaccc atagtaatc aacagagctg 6300  
tcgcatttcc aacattgaaa cagttataga attccagcag aagaacagca gattgttgg 6360  
aatcaacaga gaattcagtg tcaatgcagg tgtaacaaca ccttaagca cttacatgtt 6420  
aacaacagt gagttactat cattgatcaa tgatatgcct ataacaaatg atcagaaaaa 6480  
attaatgtca agcaatgttc agatagtaag gcaacaaagt tattctatca tgtctataat 6540  
aaaggaagaa gtccttgcatt atggttaca gctaccttac tatgggttaa tagatacacc 6600  
ttgctgaaa ttacacacat cacctctatg caccaccaac atcaaagaag gatcaaataat 6660  
ttgtttaaca aggactgata gaggatggta ttgtgataat gcaggatcag tattttttttt 6720  
tccacaggct gacacttgta aagtacagtc caatcgagta ttttgtaca ctatgaacag 6780  
tttgacatta ccaagtgaag tcagcctttg taacactgac atattcaatt ccaagtatga 6840  
ctgcaaaatt atgacatcaaa aacagacat aagcagctca gtaattactt ctcttggagc 6900  
tatagtgta tgcattatggta aaactaaatg cactgcatttca aacaaaaatc gtgggattat 6960  
aaagacattt tctaattgggt gtgactatgt gtcaacaaaaa ggagtagata ctgtgtcagt 7020  
gggcaacact ttatactatg taaacaagct ggaaggcaag aacctttatg taaaagggga 7080  
acctataata aattactatg accctctatg gtttccttctt gatgagtttgc atgcataat 7140  
atctcaagtc aatgaaaaaaa tcaatcaaag ttttagctttt attcgttagat ctgatgaatt 7200  
actacataat gtaaaatactg gcaaatctac tacaatattt atgataacta caattattat 7260  
agtaatcatt gtatgtattt tatcattaaat agctattggt ttgtgttgc attgcaagc 7320  
aaaaacaca ccagttacac taagcaaaga ccaactaagt ggaatcaata atattgcatt 7380  
cagcaaatacc acaaaaaacc acctgatcat gtttcaacaa cagtcgtctg atcaccac 7440  
ccaaatcaac ccataacaaa cacttcacca tcacagtaca ggctgaatca ttttttcaca 7500  
tcatgttacc cacacaacta agcttagatcc ttaactcata gttacataaa aacctcaagt 7560  
atcacaatca aacactaaat caacacatca ttcacaaaaat taacagctgg ggcaaatatg 7620  
tcgcaagaa atcccttgcattt atttgagatt agaggtcatt gcttgaatgg tagaagatgt 7680  
caactacatc ataattactt tgaatggctt cctcatgcct tactgtgag gcaaaacttc 7740  
atgttaaaca agatactcaa gtcaatggac aaaagcatag acactttgtc taaaataagt 7800  
ggagctgctg aactggacag aacagaagaa tatgctttt gatgatgttgg agtgcataag 7860  
agttacatag gatctataaa caacataaca aaacaatcag catgtgttgc tatgatgaaa 7920  
cttcttattt agatcaatag tgatgacatt aaaaagctga gagataatga agaacccaaat 7980  
tcacctaaga taagagtgtt caatactgtt atatcataca ttgagagcaa tagaaaaaaac 8040  
aacaagcaaa caatccatct gctcaaaaaga ctaccagcag acgtgctgaa gaagacaata 8100

aaaaacacat tagatatcca caaaagcata atcataagca accaaaaga gtcaaccgtg 8160  
aatgatcaaa atgaccaaac caaaaataat gatattaccg gataaatatc cttgtat 8220  
atcatccata ttgatttcaa gtgaaagcat gattgctaca ttcaatcata aaaacatatt 8280  
acaatttaac cataaccatt tggataacca ccagcgat ttaaataata tatttgatga 8340  
aattcattgg acacctaaaa acttattaga tgccactcaa caatttctcc aacatctaa 8400  
catccctgaa gatataatata caatataat attagtgtca taatgcttgg ccataacgt 8460  
tctatatacat ccaaccataa aactatctt ataaggat gggacaaaat ggatcccatt 8520  
attaatggaa actctgtcaa tgttatcta actgatagtt attaaaagg tgatctct 8580  
tttcagaat gtaatgctt agggagttac ctttttaacg gcccttatct caaaaatgat 8640  
tacaccaact taatttagtag acaaagtcca ctactagagc atatgaatct taaaaaacta 8700  
actataaacac agtcattat atctagatata cataaaggat aactgaaatt agaagaacca 8760  
acttatttcc agtcattact tatgacatataaaaagcatgt cctcgctcga acaaattgct 8820  
acaactaact tactaaaaa aataatacga agagctatag aaataagtga tgtaaaggat 8880  
tacgccatct tgaataaact aggactaaag gaaaaggaca gagttaaagcc caacaataat 8940  
tcaggtatgaaaactcagt acttacaact ataattaaag atgatataact ttcggctgt 9000  
gaaagcaatc aatcatatac aaattcagac aaaaatcaact cagtaaatca aaatatact 9060  
atcaaaacaa cactcttcaa aaaattgtatg tgatctatgc aacatcctcc atcatggta 9120  
atacacttgt tcaatttata tacaaaatta aataacatata taacacaata tcgatcaa 9180  
gaggtaaaaa gtcatgggtt tatattaata gataatcaaa ctttaagtgg tttcagttt 9240  
attttaatc aatatggttt ttcgttttata cataaaggac tcaaaaaat cacaactact 9300  
acttacaatc aatttttaac atggaaagac atcagccctt gcagattaaa tgatctt 9360  
attacttggta taagtaattt tttgaataca ttaaataaaaa gcttagggct gagatgtgga 9420  
ttcaataatg ttgtgttatac acaatttattt ctttatggag attgtataact gaaatttattt 9480  
cataatgaag gcttctacat aataaaagaa gtagaggat ttattatgtc ttaattct 9540  
aacataacag aagaagatca atttagaaaa cgattttata atagcatgtc aaataacatc 9600  
acagatgcag ctatataaggc tcaaaaagac ctactatcaa ggttatgtca cactttatta 9660  
gacaagacag tgcgtatcaa ttcataat ggttaatgga taatcctt aagtaaattt 9720  
cttaaatttga ttaagcttgc aggtgataat aatctcaata atttgagtga gctatattt 9780  
cttttgcataa tctttggaca tccaaatgggtt gatgaaagac aagcaatgga tgctgt 9840  
attaaactgtatgaaatgaaactaa gttctactta ttaagtagtc taagtagt 9900  
ttcatttata gaatcataaa agggtttgcataa aatacctaca acagatggcc cactttt 9960  
aatgctatttgcataa ttcataatggac tagtttgcataa agaaattaca tgccatcaca tataaaaaat 10200  
tatatagaac atgaaaatgtt gaaatgttgcataa aacttata aacttaatac ttatccatct 10020  
ctacttgcataa ttcataatggac tagtttgcataa aacttata aacttaatac ttatccatct 10080  
tttcatctgc tcaaaaaatgtt gatgttgcataa aacttata aacttata aacttata 10140  
ccaaaagatc taatatggac tagtttgcataa agaaattaca tgccatcaca tataaaaaat 10200  
tatatagaac atgaaaatgtt gaaatgttgcataa aacttata aacttaatac ttatccatct 10260  
tattacttgcataa ttcataatggac tagtttgcataa aacttata aacttata aacttata 10320  
agctatctca acaactctaa tcacgtggta tcactaactg gtaaagaaaag agagctcagt 10380  
gttagttgcataa ttcataatggac tagtttgcataa aacttata aacttata aacttata 10440  
aaaatgtatgaaatgaaactaa ttcataatggac tagtttgcataa aacttata aacttata 10500  
cttagagcttc aaaaatgtatgaaatgaaactaa ttcataatggac tagtttgcataa aacttata 10560  
aatgataact acaacaatata ttcataatggac tagtttgcataa aacttata aacttata 10620  
aatcaagcat ttagatatgaaatgaaactaa ttcataatggac tagtttgcataa aacttata 10680  
ggagttgcataa ttcataatggac tagtttgcataa aacttata aacttata aacttata 10740  
acatataagac atgcacctcc ttcataatggac tagtttgcataa aacttata aacttata 10800  
gaacaaaatgtt gattatacag atatcatatg ggtggatattt gggctgggtg tcaaaaaactg 10860  
tggaccatttgcataa ttcataatggac tagtttgcataa aacttata aacttata 10920  
acagctctgcataa ttcataatggac tagtttgcataa aacttata aacttata 10980

gagggtcaga cccatgctca agcgaggattat ttgttagcat taaatagcct taaattgcta 11040  
tataaagagt atgcaggtat aggccataag ctttaaggaa cagagaccta tatatcccga 11100  
gatatgcagt tcatgagcaa aacaatccag cacaatggag tgtactatcc agccagtttc 11160  
aaaaaaagtcc tgagagtagg tccatggata aatacaatac ttgtatgattt taaagtttgt 11220  
tttagaatcta taggtagctt aacacaggag tttagaataca gaggggaaag cttattatgc 11280  
agtttaatat ttaggaacat ttgggttatac aatcaaattt ctttgcactt ccgaaatcat 11340  
gcattatgtt acaataagct atatttagat atattgaaag tattaaaaca cttaaaaact 11400  
tttttaatc ttgtatgatcgatcgatggcg ttatcattgt atatgaattt gcctatgctg 11460  
tttggtggtg gtgatcctaa ttgttatcgaaatctttt ataggagaac tccagacttc 11520  
cttacagaag ctatagtaca ttcaatgtttt gtgttagctt attatactgg tcacgattta 11580  
caagataagc tccaggatct tccagatgtat agactgaaca aattcttgac atgtgtcatc 11640  
acattcgata aaaatccccaa tgccgagttt gtaacattga tgagggatcc acaggcggtt 11700  
gggtctgaaa ggcaagctaa aattactagt gagattaata gattagcagt aacagaagtc 11760  
ttaagtatag ctccaaacaa aatattttctt aaaagtgcac aacattatac taccactgag 11820  
attgatctaa atgacattat gcaaaatata gaaccaactt accctcatgg attaagagtt 11880  
gtttatgaaa gtctaccttt ttataaagca gaaaaaaatag ttaatcttattt atcaggaaca 11940  
aaatccataa ctaatataact tgaaaaaaca tcagcaatag atacaacttga tattaaatagg 12000  
gctactgata tgatgaggaa aaatataact ttacttataa ggatacttcc actagattgt 12060  
aacaaagaca aaagagagttt attaagttt gaaaatctt gtataacttga attaagcaag 12120  
tatgttaagag aaagatcttgc ttcattatcc aatatactttagt gagaacatc gccaagtatt 12180  
atgttcacaa tggacattaa atatacaactt agcactatag ccagtggat aattataagaa 12240  
aaatataatg ttaatagttt aactcgtggt gaaagaggac ctactaagcc atgggttaggt 12300  
tcatctacgc aggagaaaaa aacaatgcca gtgtacaata gacaagttt aaccaaaaaag 12360  
caaagagacc aaatagattt attagcaaaa ttagactggg tataatgcattt catagacaac 12420  
aaagatgaat tcatggaaga actgagttactt ggaacacttgc gactgtcata tgaaaaagcc 12480  
aaaaaaagtgtt ttccacaata tctaagtgtc aattattttac accgttttac agtcagttgt 12540  
agaccatgtt aattccctgc atcaataccatca gcttataaaaaa caacaaatattt tcatttcgt 12600  
acttagtcata tcaatcatgtt attaacagaa aagtatggag atgaagatattt cgacattgtg 12660  
tttcaaaattt gcataagttt tggctttagc ctgtatgtcgg ttgtggaaaca attcacaac 12720  
atatgtcata atagaattt tctcataaccatca aagctgaatg agatacattt gatgaaacct 12780  
cctatattta caggagatgt tgatatcatc aagttgaagc aagtgtatca aaaacagcat 12840  
atgttcatac cagataaaaat aagtttaccatca aatatactttagt aattatttcctt aagtaacaaa 12900  
gcacttaaat ctggatctaa catcaatttca aatttaatattt tagtacataa aatgtctgt 12960  
tattttcata atgcttataat tttaatgtactt aatttagcttgc gacattggat tctaattttt 13020  
caacttatga aagattcaaa aggtatTTT gaaaaagatt gggggaggggtt gtacataact 13080  
gatcatatgtt tcattaaattt gaatgttttgc ttaatgtctt ataagactt tttgctatgt 13140  
tttcataaaag gtatggtaa agcaaaatattt gaatgtgata tgaacacttgc agatcttctt 13200  
tgtgtttgg agttaataga cagtagctac tggaaatcttgc tgcataatgtt tttcctagaa 13260  
aaaaaaagtca taaaatacat agtcaatcaaa gacacaagttt gatgatgat aaaaaggctgt 13320  
cacagttta agttgtgggtt tttaaaaacgc cttatataatg cttaaatttac cgtatgccct 13380  
tgggttgttta acatagatca tcacccaaaca catatgaaag ctatatttac ttacatagat 13440  
tttagtttagaa tggggtttaat aaatgttagat aaattaacca ttaaaaataaa aaacaaatttcc 13500  
aatgtatgtt tttacacatc aaatctttt tacatttttgc ttttttttca agacaacact 13560  
catttgcataa caaaacaaat aagaatttgc aatttgcataatg ttttttttca agacaacact 13620  
ctatatcacc caaccccaaga aacttttagaa aatataatcatc taatttgcactt taaaagttgt 13680  
aatagtaaca aacctaaattt ttgtataatgtt gggaaataccg aatctataat gatgtcaaca 13740  
ttctctataa aatgtcatat taaaatcttcc actgtttacca caagatttcaaa ttatagcaaa 13800  
caagacttgc acaatTTTt tccaaatgtt ttgtatgatca gggattttttca ttatagcaaa 13860

aatacagcaa aatctaacc aactttacatc accacttcac atcagacatc tttagtaagg 13920  
aatagtgcac cactttattt catgtttccct tggcatcatg tcaatagatt taactttgtt 13980  
tttagttcca caggatgcaa gatcagtata gagtatattt taaaagatct taagattaag 14040  
gaccggcgtt gtatagcatt cataggtgaa ggagctggta acttattttt acgtacggta 14100  
gtagaacctc atccagacat aagatacatt tacagaagtt taaaagattt caatgtatcat 14160  
agtttaccta ttgaattttt aagattatac aacgggcata taaacataga ttatggtgag 14220  
aatttaacca ttctgtctac agatgcaact aataacattt atttgttta tttacatata 14280  
aaatttgcag aaccttattt catctttgtc tgcgatgctg aattacctgt tacagccat 14340  
tggagtaaaa ttataatttga atggagtaag catgtaaagaa agtcaagta ctgttcttct 14400  
gtaaaatagat gcattttat cgcaaaaatat catgctcaag atgatatttga tttcaaattt 14460  
gataacatta ctatattttt aacttacgtg tgccttaggtt gcaagttttt aggatctgaa 14520  
gtttacttag tccttacaat aggccctgca aatataacttc ctgtttttgtt tggtgtgca 14580  
aatgctaaat tgatTTTTC aagaactaaa aatttcattt tgcctaaaaaa aactgacaag 14640  
gaatctatcg atgcaaaatat taaaagctt atacctttcc tttgttaccc tataacaaaa 14700  
aaaggaatttta agacttcatt gtcaaaaattt aagagtgttag ttaatgggta tatattatca 14760  
tattctatag ctggacgtt a tgaagtattt agcaacaagg ttataaacc tcaagcatatg 14820  
aatatccaa aatggctaga tcatgtttt aatttttagat cagctgaact taattacaat 14880  
catttataca tgatagagtc cacatatttct tacttaagt aattgtttaaa tagtttaaca 14940  
accaatggc tcaagaaaact gattaaaata acaggtgtt tactatacaa cttcccaac 15000  
gaacagtaac taaaatattt attaacaagt ttggtcaat ttagatgttca acacatcatt 15060  
atattatagt tattttttttt tatgcaaaact tttcaataat ttagcttact gattccaaaa 15120  
ttatcattttt atttttaagg ggttgaataa aagtctaaaa ctaacaatgtt tacatgtgca 15180  
tttacaacac aacgagacat tagttttgtt cactttttt ctcgt 15225

<210> 3

<211> 33

<212> DNA

### <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

### Positive-sense M gene fragment

<400> 3

actcaaataa gttaataaaa aatatcccg gat

33

<210> 4

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> De

Nega

cccप्रप्तगा-

1

<210> 5  
<211> 18  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Positive-sense primer upstream of SH gene

<400> 5  
gaaagtatat attatgtt 18

<210> 6  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Negative-sense primer downstream of SH gene

<400> 6  
tatataagca cgatgatatg 20

<210> 7  
<211> 16  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Positive-sense M gene fragment

<400> 7  
actcaaataa gttaat 16

<210> 8  
<211> 14  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Negative-sense M gene fragment

<400> 8  
taaccttattt gagt 14

<210> 9  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Forward PCR primer for NS1 gene deletion

<400> 9  
gacacaaccc acaatgataa tacaccac 28

<210> 10  
<211> 32  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Reverse PCR primer for NS1 gene deletion

<400> 10  
catctctaac caagggagtt aaatttaagt gg 32

<210> 11  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Forward PCR primer for NS2 gene deletion

<400> 11  
ttaaggagag atataagata gaagatg 27

<210> 12  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Reverse PCR primer for NS2 gene deletion

<400> 12  
gttttatatt aactaatggc gtttagtg 27

<210> 13  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Forward PCR primer for ablation of G gene start site

<400> 13  
ttataattgc agccatcata ttcatagcct cgg 33

<210> 14  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Reverse PCR primer for ablation of G gene start site

<400> 14  
gtgaaggta gattacaatt gccagaatgg 30

<210> 15  
<211> 48  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Positive-sense primer for intergenic region preceding the G gene

<400> 15  
gcatggatcc ttaattaaaa attaacataa tgatgaatta ttagtatg 48

<210> 16  
<211> 51  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Negative-sense primer for intergenic region downstream of F gene

<400> 16



<400> 20  
agttatataa aa

12

<210> 21  
<211> 13  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: G gene-end  
signal of RSV A2

<400> 21  
agttacttaa aaa

13 \*